CLAIMS

1.- An active monitoring device within a safety perimeter of a motor vehicle, for the detection of moving objects or static obstacles within said safety perimeter, comprising of a first detector (5, 20) which has a first detection angle and a first radius of action, which covers a first detection zone that includes at least part of a blind angle of said vehicle, where said first detector (5, 20) transmits input signals to at least one data processing device that generates output signals suitable to activate warning means for the driver, CHARACTERISED in that it further comprises at least a second detector (11, 21), which has a second detection angle and a second radius of action, which covers a second detection zone and forms, with said first detector (5, 20), a group, with said first and at least one second detectors (5, 11; 20, 21) cooperating in order to cover a combined detection zone of said blind angle, which is enlarged with respect to that covered by the first detector and which forms a sector of said safety perimeter; and in that said first and at least one second detectors (5, 11; 20, 21) of said group share the same warning means that can be activated via the processing of the output signals from each one.

2.- A device in accordance with claim 1, characterised in that each of the cited detectors (5, 20; 11, 21) can be activated or not or perform differential processing on the captured information as a function of the vehicle's speed.

3.- A device in accordance with claim 1, characterised in that said first detector (5) is oriented towards a side lane adjacent to said motor vehicle and said at least one second detector (11) of said group, is oriented, at least partly, towards said same side lane and the area covered by said second detector (11) extends towards the rear of the vehicle.

4.- A device in accordance with claim 3, characterised in that said at least one data processing device operates by processing simultaneously and separately, each of said input signals (5, 11).

5.- A device in accordance with claim 1, characterised in that said first detector (20), of said group, covers a blind angle that extends in front of the vehicle and extends towards a first side zone and said at least one second detector (21) covers an area (21a) that extends to the front of the vehicle towards a second zone located on the opposite side of the vehicle.

6.- A device in accordance with claim 1, characterised in that said first detector (20) of said group covers a blind angle that extends in front of the vehicle and extends

towards a first side zone and said second detector (5) covers a zone that extends to the rear making longer a second side zone opposite said first side zone.

7.- A device in accordance with claim 3, characterised in that in addition to a first group having said first and at least one second detector (5, 11), oriented towards a side lane adjacent to the vehicle, it comprises a second group having first and second detectors (20, 21), where said first detector (20) covers a blind angle that extends in front of the vehicle and extends towards a first side zone and said second detector (21) covers an area (31) that extends in front of the vehicle towards a second zone located on the opposite side of the vehicle.

8.- A device in accordance with claim 3, characterised in that in addition to a first group having said first and at least one second detector (5, 11) on one side of the vehicle comprises a second group having first and second detectors, where a first detector (20) of the second group covers a blind angle that extends in front of the vehicle and extends towards a first side zone and a second detector (5) of said second group coincides with the first detector of the first group.

9.- A device in accordance with claim 1, characterised in that said first detection angle is wider than said second angle and in that said second radius of action is larger than said first radius of action.

10.- A device in accordance with claim 1, characterised in that the position of said second detector (11) in the vehicle is such that it can detect a vehicle in said side lane at a distance from said motor vehicle that is greater than the radius of action of said first detector (5) and in that it is intended to employ differential processing of the data captured by said first (5) and second detectors (11) as a function of their positions on the vehicle.

11.- A device in accordance with claim 3, characterised in that it incorporates a third detector (7) oriented towards a lane adjacent to said motor vehicle, which covers a detection zone that includes at least part of a blind angle of said vehicle, with said third detector (7) being placed on a side of the vehicle opposite that of said first detector (5).

12.- A device in accordance with claim 11, characterised in that it incorporates a fourth detector (13) installed at the rear of said motor vehicle, or on a side zone, more rear than the cited third detector (7), on a side of the vehicle opposite that covered by said first detector (5) and in that said third and fourth detectors (7, 13) cooperate to cover a first zone of an adjacent lane and a second zone that extends to the rear of the vehicle, operating as one of said groups having first and second detectors (5, 11).

13.- A device in accordance with claim 5, characterised in that it further incorporates two groups of a first and second detectors (5, 11; 7, 13) on opposite sides of the vehicle.

14.- A device in accordance with claim 13, characterised in that it incorporates at least an additional detector (30) installed in an intermediate zone of a side of the vehicle, and that covers an area (30a) which comprise a blind angle including an access of the vehicle, whose area (30a) together with the area (21a) permit to carry out a monitoring of ones doors of the vehicle, in accordance with an specific functionality of said cameras in static situation.

15.– A device in accordance with claim 1, characterised in that said first detector (5, 20) is installed in the body or structure of an outside rear-view mirror on said motor vehicle.

16.– A device in accordance with claim 15, characterised in that said second detector (11, 13) is installed at the rear of said motor vehicle or in a side zone, more rear than the cited first detector (5, 7).

17.- A device in accordance with claim 4, characterised in that said group having a first and at least one second detector (5, 11) is installed in the body or structure of an outside rear-view mirror on said motor vehicle,

18.- A device in accordance with claim 1, characterised in that said warning means receive a first combined signal, where said first combined signal is obtained by applying a "OR" logic function between said processed output signals corresponding to the first (5, 20) and second detector (11, 21), of each group having one first and at least one second detector (5, 11; 20, 21).

19.- A device in accordance with claim 12, characterised in that said third and fourth detectors (7, 13) share the same warning means.

20.- A device in accordance with claim 18, characterised in that said warning means receive a second combined signal, where said second combined signal is obtained by applying a "OR" logic function between said processed output signals corresponding to said third detector (7) and said fourth detector (13).

21.- A device in accordance with one of the previous claims, characterised in that at least one of said detectors is an optical camera suitable for operating in the visible light and/or infrared spectra.

22.- A device in accordance with the previous claims, characterised in that each of said detectors of said groups having at least two detectors that cooperate to cover a combined detection zone are directly connected to a corresponding data processing device, forming part of a single integrated circuit or connected to said processor via a support or connection printed circuit .

23.- A device in accordance with claim 12 or 13, characterised in that said second and fourth detectors (11, 13) comprise detection means for detecting the distortion of the earth's magnetic field and suitable for the detection of at least two of the three spatial components of a magnetic field.

24.- A device in accordance with claim 12 or 13, characterised in that said second and fourth detectors (11, 13) are made up of a magnetic field sensor capable of generating electrical signals as a function of said magnetic field, and prepared to detect at least two of the three spatial components of a magnetic field and in that said sensors are installed symmetrically with respect to the vehicle's longitudinal axis, and are connected to an electronic circuit that calculates the difference of the signals generated by each of said sensors.

25.- A device in accordance with claim 12 or 13, characterised in that said second detector (11) and/or said fourth detector (13) are located at the rear of the vehicle or on a trailer of the same and which are only activated at a minimum speed of said motor vehicle.

26.- A device in accordance with claim 12 or 13, characterised in that said group having a first and at least one second detector (5, 11; 7, 13) include a module for the detection of vehicles without any relative speed, in other words travelling at the same speed as the vehicle fitted with said detectors, within a preset margin of tolerance.

27.- A device in accordance with claim 12 or 13, characterised in that only said first detector (5, 7) of each group is fitted with a module for the detection of vehicles without any relative speed.

28.- A device in accordance with claim 12 or 13, characterised in that said second and fourth detectors (11, 13) consist of an optical camera and present detection areas (9) that overlap at least partially and in that said device employs stereoscopic vision techniques to determine the approximate distance and relative speed of objects detected within said detection areas (9), when the vehicle in motion, or the height and/or movement of objects or the distances to them, when the vehicle is parked.

29.- A device in accordance with claim 5, characterised in that said first and second detectors (20, 21) consist of an optical camera and present detection areas (30, 31) that overlap at least partially and in that said device employs stereoscopic vision techniques to determine the height and/or movement of objects located within said detection areas when the vehicle is parked.

30.- A device in accordance with claim 12 or 13, characterised in that the interconnection between at least part of the cited detectors (5, 11; 20, 21; 7; 13) the

means of processing their input signals and the cited warning means is performed by radiofrequency communications.

31.- A device in accordance with claim 1, 26 or 27 characterised in that it further includes means to display an image of at least part of the field covered by the cited cameras.

32.- A device in accordance with claim 12 or 13, characterised in that all the detector devices consist of optical cameras working in the visible light and/or infrared spectra.

33.- An active monitoring method within a safety perimeter of a motor vehicle for the detection of moving objects or static obstacles in an area of risk close to said vehicle consisting of:

- acquiring data from at least two differentiated detection zones within said safety perimeter by means of a group comprising a first detector (5, 20) that covers a first zone and at least one second detector (11, 21) that covers a second zone which is contiguous or partly superposed to said first zone and which extends it, defining a joint detection zone, which includes a sector of said safety perimeter, with at least one of said detectors (5, 20, 11, 21) being an optical camera suitable for working in the visible light and/or infrared spectra;
- processing the signals acquired by at least two detectors (5, 20; 11, 21); and
- generating warning signals in the case of detecting an object involving risk or an insurmountable obstacle, existing in said joint detection zone, applying a "OR" logic function to said processed signals, corresponding to said first detector (5, 20) and to said second detector (11, 21).

34.- A method in accordance with claim 33, characterised in that said process comprises a simultaneous, separate treatment of the input signals provided by said first detector (5, 20) and second detector (11, 21).

35.- A method in accordance with claim 33, characterised in that a differentiated processing of the data captured by each detector is carried out as a function of the position occupied by each of said groups of detectors (5, 20; 11, 21) on the vehicle.

36.- A method in accordance with claim 33, characterised in that each of the cited detectors (5, 20; 11, 21) is capable of being activated or not, of being ignored, or of carrying out differential processing of the captured data as a function of the vehicle speed.

37.- A method in accordance with claim 33, characterised in that it comprises using several detector groups, each consisting of a first and at least one second detector employed to cover several sectors of said safety perimeter, with the detectors sharing the same warning means, specific for said group.

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